THAT WHICH IS CLAIMED:

1.   A site based dynamic distribution system for distributing an audio signal over a local network for the site, the system comprising:

a network interface that receives digital audio streams and outputs the digital audio streams on a local network for the site using an Internet protocol (IP) address based protocol and wherein ones of the digital audio streams have different associated identifiers;

a plurality of network attached audio devices configured to receive a selected digital audio stream over the local network for the site based on a designated one of the associated identifiers and to output the received digital audio stream to audio equipment located at the site, each of the respective network attached audio devices being associated with a different group of audio equipment;

a user interface configured to receive a user designation of aggregations of the audio equipment located at the site; and

a controller coupled to the plurality of network attached audio devices that designates the associated identifiers to be received by respective ones of the plurality of network attached audio devices based on the user designation to provide dynamic zone aggregation of the audio equipment at the site.

2.   The system of Claim 1 wherein the site is a residence and wherein ones of the groups of audio equipment are associated with respective rooms of the residence.

3.   The system of Claim 1 wherein the address based protocol comprises a User Datagram Protocol (UDP).

4.   The system of Claim 3 wherein the address based protocol further comprises a Real-time Transport Protocol (RTP) and the network interface comprises an RTP interface.

27

5.   The system of Claim 4 wherein the RTP interface outputs the digital audio streams using time-stamped packets using UDP.

5   6.   The system of Claim 1 wherein the plurality of network attached audio devices are configured to provide a salutation protocol to announce their presence to the controller over the local network.

7.   The system of Claim 6 wherein the controller is further configured 10   to assign the associated identifier to be received by respective ones of the plurality of network attached audio devices to the network attached audio devices over the local network using the salutation protocol so as to group ones of the plurality of network attached audio devices.

15   8.   A site based dynamic distribution system for distributing an audio signal over a local network for the site, the system comprising:

a plurality of addressable audio devices coupled to the local network and configured to receive a designated digital audio stream over the local network for the site and to output the received digital audio stream to audio equipment located 20   at the site;

a zone manager that defines a plurality of zones for the site, at least one of the zones including at least two of the addressable audio devices and that defines a relationship between a characteristic of the audio signal for a reference audio device and for the at least two of the addressable audio devices in the at least one 25   of the zones;

an audio interface that receives digital audio streams and outputs the digital audio streams on the local network addressed to selected ones of the audio devices based on the defined zones, the defined relationship between a characteristic of the audio signal for a reference audio device and for the at least two of the addressable 30   audio devices and a control input associated with the characteristic; and

a user interface configured to receive a user designation of the control input.

9.   The system of Claim 8 wherein the characteristic is at least one of a volume, a tone and a balance.

10.   The system of Claim 8 wherein the characteristic is an equalization specification and wherein the audio devices further comprise an equalizer circuit.

11.   The system of Claim 8 wherein the audio interface and the zone manager are included in an Open Services Gateway initiative (OSGi) gateway configured to couple the local network to an external internet protocol network.

12.   The system of Claim 8 wherein the audio interface further comprises an RTP interface that outputs the digital audio streams using a UDP protocol.

13.   The system of Claim 8 wherein the zone manager further comprises a virtual effect circuit that generates a virtual effect defining a relationship between a characteristic of the audio signal for a reference audio device and for ones of the audio devices in a specified one of the plurality of zones and wherein the user interface is further configured to receive a designation of a desired virtual effect for a desired one of the plurality of zones.

14.   The system of Claim 13 wherein the characteristic is an equalization specification and wherein the generated virtual effect specifies different equalizations to ones of the audio devices in the desired one of the plurality of zones.

15.   The system of Claim 13 wherein the desired virtual effect comprises a plurality of different virtual effects, ones of which are applied to different ones of the audio devices in the desired one of the plurality of zones.

5

16.   The system of Claim 13 wherein the virtual effect circuit comprises an audio mixer circuit that receives a plurality of designated digital audio streams and provides a mixed audio stream for output by the audio interface to at least one of the audio devices.

10

17.   The system of Claim 16 wherein the virtual effect comprises a virtual reality effect and wherein at least one of the plurality of designated digital audio streams is associated with a reference position in the site and wherein the audio mixer circuit is configured to provide different mixed audio streams for at least two of the addressable audio devices wherein a characteristic of the at least

15   one of the plurality of designated digital audio streams in the respective mixed audio streams is based on a relative position between associated audio equipment of the at least two of the addressable audio devices and the reference position.

18.   The system of Claim 17 wherein the user interface is configured to

20   receive a user designation of a desired virtual reality effect as the control input.

19.   The system of Claim 17 wherein a plurality of designated digital audio streams are associated with different reference positions in the site.

25

20.   The system of Claim 8 wherein the relationship between a characteristic of the audio signal for a reference audio device and the at least two of the addressable audio devices comprises a relative relationship.

21.   The system of Claim 20 wherein the relative relationship between

30   the reference audio device and one of the at least two of the addressable audio

devices is a proportional relationship and wherein the relative relationship between the reference audio device and another of the at least two of the addressable audio devices is a static relationship.

5   22.   The system of Claim 8 wherein the digital audio streams are MP3 streams.

        23.   The system of Claim 20 wherein the relative relationship between the reference audio device and one of the at least two of the addressable audio
10   devices comprises a maximum level.

        24.   The system of Claim 8 wherein a plurality of the addressable audio devices are bundled on a shared substrate to provide a preamplifier, the preamplifier having a single interface to the local network shared by the
15   addressable audio devices on the preamplifier and a network switch circuit that routes digital audio streams to addressed ones of the addressable audio devices on the preamplifier.

        25.   A method for dynamic distribution of an audio signal over a local
20   network for a site, the method comprising:
                receiving digital audio streams at an interface to the local network;
                associating the digital audio streams with identifiers;
                providing the digital audio streams over the local network with the
        associated identifiers using an Internet protocol (IP) address based protocol;
25   receiving a user designation of aggregations of groups of audio equipment
        at the site, each group of audio equipment being associated with an addressable
        audio device coupled to the local network;
                dynamically designating to respective ones of the addressable audio devices
        in an aggregation of groups of audio equipment one of the identifiers associated
30   with a digital audio stream to be received by the respective ones of the addressable

audio devices in the aggregation of groups and output to their associated group of audio equipment responsive to the received user designation;

receiving the digital audio stream associated with the designated identifier at the respective ones of the addressable audio devices over the local network; and

5   outputting the received digital audio stream to the groups of audio equipment associated with the respective ones of the addressable audio devices.

26.   The method of Claim 25 wherein the dynamic designations are provided to the audio devices over the local network.

10

27.   The method of Claim 26 wherein providing the digital audio streams over the local network further comprises providing the digital audio streams over the local network based on a User Datagram Protocol (UDP).

15   28.   The method of Claim 27 wherein providing the digital audio streams over the local network further comprises providing the digital audio streams over the local network based on a Real-time Transport Protocol (RTP).

29.   The method of Claim 28 wherein RTP provides the digital audio

20   streams using time-stamped packets using UDP.

30.   The method of Claim 25 further comprising the step performed by the addressable audio devices of providing a salutation protocol to announce their presence over the local network.

25

31.   The method of Claim 30 wherein the dynamic designations are provided to the addressable audio devices over the local network using the salutation protocol so as to group ones of the plurality of network attached audio devices.

30

32.   A method for dynamic distribution of an audio signal in a zoned environment, the method comprising:

defining a plurality of zones in the zoned environment, at least one of the defined zones including at least two addressable audio devices;

defining a relationship between a characteristic of the audio signal for a reference audio device and for the at least two of the addressable audio devices;

distributing the audio signal to the at least two of the addressable audio devices based on the defined relationships and a control input associated with the characteristic;

receiving an update to the control input from a user; and

distributing the audio signal to the at least two of the addressable audio devices based on the defined relationships and the update to the control input.

33.   The method of Claim 32 further comprising receiving the audio signal as a digital audio stream and wherein the steps of distributing the audio signal to the at least two of the addressable audio devices comprise distributing the digital audio stream over a local network of the zoned environment.

34.   The method of Claim 33 wherein the step of defining a relationship further comprises generating a virtual effect that defines a relationship between a characteristic of the audio signal for a reference audio device and for ones of the audio devices in a specified one of the plurality of zones and wherein the method further comprises receiving a designation of a desired virtual effect for a desired one of the plurality of zones.

35.   The method of Claim 34 wherein the characteristic is an equalization specification and wherein the step of generating a virtual effect further comprises specifying different equalizations to ones of the audio devices in the desired one of the plurality of zones.

36.   The method of Claim 34 wherein the desired virtual effect comprises a plurality of different virtual effects, ones of which are applied to different ones of the audio devices in the desired one of the plurality of zones.

37.   The method of Claim 34 wherein the step of receiving the audio signal as a digital audio stream further comprises the step of receiving a plurality of digital audio streams and wherein generating a virtual effect further comprises generating a mixed audio stream from ones of the received plurality of digital audio streams for distribution to at least one of the addressable audio devices over the local network.

38.   The method of Claim 37 wherein the virtual effect comprises a virtual reality effect and wherein at least one of the plurality of designated digital audio streams is associated with a reference position in the zoned environment and wherein the step of generating a mixed audio stream further comprises the step of generating different mixed audio streams for at least two of the addressable audio devices wherein a characteristic of the at least one of the plurality of designated digital audio streams in the respective mixed audio streams is based on a relative position between associated audio equipment of the at least two of the addressable audio devices and the reference position.

39.   The method of Claim 38 further comprising receiving a user designation of a desired virtual reality effect as the control input.

40.   The method of Claim 38 wherein a plurality of designated digital audio streams are associated with different reference positions in the zoned environment.

41.   A computer program product for dynamic distribution of an audio signal over a local network for a site, the computer program product comprising:

a computer-readable storage medium having computer-readable program code embodied in said medium, said computer-readable program code comprising:

computer-readable program code which receives digital audio streams at an interface to the local network;

5   computer-readable program code which associates the digital audio streams with identifiers;

computer-readable program code which provides the digital audio streams over the local network with the associated identifiers;

computer-readable program code which receives a user designation of

10   aggregations of groups of audio equipment at the site, each group of audio equipment being associated with an addressable audio device coupled to the local network;

computer-readable program code which dynamically designates to respective ones of the addressable audio devices in an aggregation of groups of

15   audio equipment one of the identifiers associated with a digital audio stream to be received by the respective ones of the addressable audio devices in the aggregation of groups and output to their associated group of audio equipment responsive to the received user designation;

computer-readable program code which receives the digital audio stream

20   associated with the designated identifier at the respective ones of the addressable audio devices over the local network; and

computer-readable program code which outputs the received digital audio stream to the groups of audio equipment associated with the respective ones of the addressable audio devices.

25

42.   A computer program product for dynamic distribution of an audio signal in a zoned environment, the computer program product comprising:

a computer-readable storage medium having computer-readable program code embodied in said medium, said computer-readable program code comprising:

computer-readable program code which defines a plurality of zones in the zoned environment, at least one of the defined zones including at least two addressable audio devices;

5   computer-readable program code which defines a relationship between a characteristic of the audio signal for a reference audio device and for the at least two of the addressable audio devices;

computer-readable program code which distributes the audio signal to the at least two of the addressable audio devices based on the defined relationships and a control input associated with the characteristic;

10   computer-readable program code which receives an update to the control input from a user; and

computer-readable program code which distributes the audio signal to the at least two of the addressable audio devices based on the defined relationships and the update to the control input.

15

36